The multiple lockup expiration of government shares

--- Evidence from the Share Split Structure Reform in China

Abstract

This paper investigates the market performance around the lockup expiries of Chinese government shares since the secondary privatisation in 2005. Due to the unique feature of this privatisation, the picture is complicated with multiple lockup expiries specified in the agreements for the vast majority of the sample firms and which varied from firm to firm. This issue has never been addressed in previous literature. Additionally, global research on this topic is under-investigated. We propose that the market reactions should be examined with a deep understanding of the specific event itself, such as the lockup expiry dates written in the original agreements relative to the actual lockup expiry dates. By doing so the explanations put forward are based on a customised investigation of the firms and therefore are more likely to be plausible and convincing. We then develop our own hypotheses surrounding the implicit bargaining power of minority shareholders, which fit into the specific context in China. To test the hypotheses, we categorise "normal" and "abnormal" lockup expiries, with the "normal" expiries conforming to the dates written in the original proposals and the "abnormal" expiries deviating from the proposed dates. We estimate the cumulative excess returns (CER) with different event windows. We find that in general, the short-run CERs and long-run CER results are higher for firms with "normal" expiries than those with "abnormal" expiries, suggesting that any deviation from specified lockup expiry dates may be a signal of both the implicit bargaining power of minority shareholders and subsequent performance.

Key words: lockup expiration, market performance, secondary privatisation, implicit bargaining power, China

JEL Classification: G14, G31, G38

1 Introduction

Share lockups usually refer to agreements signed by insiders in a firm to restrict them from selling their shares for a pre-specified period of time after an IPO or SEO. The main body of literature investigates the underlying motivation for the specification of share lockups. A widely-held view is that share lockups prohibit immediate informative selling by insiders until their informational advantage over outsiders (public investors) fades away completely at the lockup expiration (Karpoff et al. 2013). As a result, any insider trading following expiration is not informative selling and market reactions around lockup expiries should be normal. However, empirical research reports significant negative excess returns around lockup expiries in both developed and developing countries (Field and Hanka 2001; Liao et al. 2011; Chong and Liu 2016), which contradicts the theory. The reasons underlying the negative excess returns are mostly hypothesised to be a result of perceived market imperfections. However, these reasons are weakly supported by the empirical evidence (Field and Hanka 2001; Cao et al. 2004; Zheng et al. 2005).

The *efficient markets hypothesis* (EMH) suggests that abnormal stock returns are associated with unexpected information around the time of lockup expiries, but cannot help explain which message would be perceived by investors. Therefore more recently a few studies have introduced the information signalling hypothesis (ISH) which further develops the EMH by relating the abnormal stock returns to the signals emitted from unexpected information around the time of lockup expiries. It is suggested that pre-known characteristics of the firms, such as transparency, performance, governance and ownership structure (Field and Hanka 2001; Hakim et al. 2012; Liao et al. 2011), and of the lockup decisions, such as the length of lockup period (Hakim et al. 2012), permanently signal the quality of firms and thus influence the abnormal stock returns around the time of lockup expiration. These studies presume that the pre-known firm characteristics and lockup features persistently send out signals over time and therefore influence the market reactions around the later lockup expiries. However, we argue that this pre-known information delivers a constant signal over time, while investors will interpret corporate actions on the lockup expiration days (new signals) rather than pre-known corporate characteristics and decisions. This perspective is under-investigated in the literature and it motivates us to conduct research to examine the signalling theory. In this paper we investigate stock returns around the lockup expiries after the Chinese secondary privatisation in 2005, also called the split share structure reform (SSSR), the unique features of which provide fruitful avenues for us to explore the appropriateness of our proposed explanation. Briefly, in order to pave the way for the secondary privatisation, government agencies who held shares in listed State-Owned Enterprise (SOE) firms made commitments in written agreements to lock up their shares for a certain period of time (at least 12 months) after the date of privatisation. In China, each listed SOE firm had several government agencies as stakeholders, and therefore it was possible for a firm to have multiple lockup expiry dates agreed between these agencies and the minority shareholders, with these dates specified in the reform proposals. This enables us to observe the market reactions over a series of lockup expiries. Also to the best of our knowledge, Liao et al. (2011) is the only study which investigates market reactions around the lockup expiration after the SSSR. However, their results must be interpreted with caution, since their incomplete data, from June 2006 to April 2007, may lead to biased results, since for many firms, a proportion of shares were still locked up two years after the SSSR. Second, they didn't consider multiple lockup expiration dates, which are dominant amongst the participating firms, over 80% of firms had more than one lockup expiry and around 65% of firms had three or more different lockup expiries.

Focussing on the start of the expiry of the lock up process we argue that a "normal" or an "abnormal" expiry signals the implicit bargaining power (IBP) of minority shareholders. Our view is that Chinese minority shareholders are not as weak as has been assumed by some scholars (for example, Firth et al. 2010). On the contrary minority shareholders consistently represent a "default" threat to the government like "the Sword of Damocles" because they have the choice to exit the market if they wish, the consequences of which the government cannot afford. We categorise the "default threat" as the IBP of minority shareholders. For example, the Chinese government had witnessed a depressed stock market for four years from 2001 to 2004 after the first failed reform process, until they invited minority shareholders to the negotiating table and finally decided to compensate them in 2005, which is a milestone in the SSSR (Zeng and McLaren 2015). Consistent with the *information signalling theory*, we propose that a "normal" lockup expiration indicates that minority shareholders have strong IBP which ensured that the government shares were unlocked precisely as planned in the agreement while an "abnormal" expiration indicates the opposite.

We calculate the CER (-1, +1) for both "normal" and "abnormal" groups and also run the statistical tests. The results support our hypothesis that "normal" expiries signal strong IBP of minority shareholders, but rejects our hypothesis that "abnormal" expiries signal weak IBP. It might be because the signal doesn't remain constant over time. Investors may readjust their perceptions if the surrounding environment which would frame investors' expectations changes. We then consider the first expiry (i.e. within each firm, the date when the first agency is cleared to trade up to 5% of the total number of shares) and compare it to the last expiry (within each firm, the date when the final agency is cleared to trade up to 5% of the total number of shares). Investors may be surprised by the "abnormality" at the first "abnormal" expiration but would feel relief at the last "abnormal" expiration because the last one puts an end to the "abnormality" which indicates a resolution to the conflicts between the stakeholders. We then check the market reactions around the first and the last "normal" and "abnormal" expiries and find more favourable CERs at the "normal" expiries than the "abnormal" expiries, which supports our hypothesis.

We obtained our data from WIND, a leading Chinese database used by the majority of universities and financial institutions in China. Subject to data availability, our final sample includes 1066 firms and there are a total of 3161 lockup expiry dates after the SSSR, in the period from 2006 to 2015. There are 1726 expiry dates which are consistent with the written lockup arrangements in the pre-set agreements and thus categorised as "normal" expiries, as well as 1435 expiry dates which are delayed and which deviated from the original agreements and thus they are categorised as "abnormal" expiries. These "abnormalities" were caused by various conflicts or disputes between the stakeholders.

In general, this study follows the literature to examine the *information signalling theory* but focuses on new signals perceived by investors around the announcement day of lock-up expirations rather than constant signals from the "pre-known" information. Second we are the first to propose that Chinese minority shareholders, though seemingly weak, may have strong but implicit bargaining powers against government counterparties. And our results show that the Chinese stock markets are capable to receive the implicit signals and respond correspondingly. The lockup expirations after the Chinese secondary privatisation are under-investigated in the literature. .

The rest of paper is organised as follows. Section 2 provides a brief introduction to Chinese secondary privatisation. Section 3 reviews and discusses the relevant literature and then proposes our research hypotheses. Section 4 explains the source of data and the selection process of our final sample with some descriptive statistics, as well as justification for the design of our research methods, including an event study design and panel-data pooled regression design. Section 5 presents the key results with critical analysis and discussions. Section 6 concludes the paper.

2 Chinese secondary privatisation

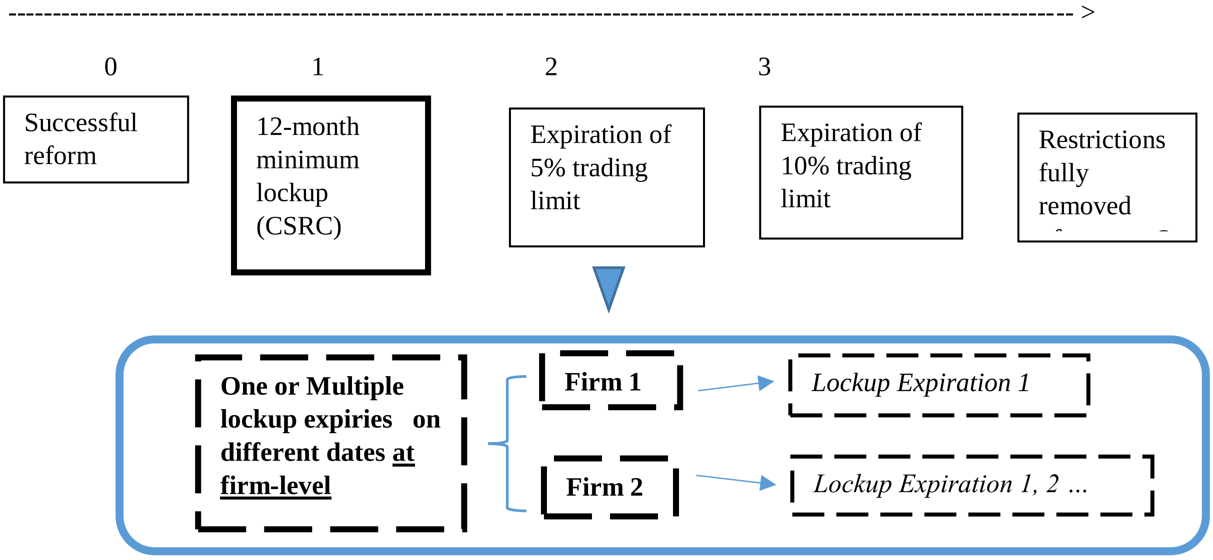
In 2005, there was a potential for global repercussions when the Chinese government launched the split share structure reform (SSSR), also called the secondary privatisation program, to sell its shares in listed SOE firms, around two-thirds of the total number of listed shares on the market at that time. The magnitude of the sale meant that the process had to be carefully planned and executed. This was particularly the case since an earlier attempt to sell the shares in 2001 had failed. Specific features of the design included compensation payments to the minority public shareholders (who had only one third of the total shares), as well as a structured, gradual process and the "lockup period" for a minimum of one year immediately after the final reform agreement was announced, where no government shares could be traded, to maintain liquidity and to ensure that blocks of shares would not be dumped on the market (Hou and Lee 2014; Zeng and McLaren 2015). After the 12-month lockup expiry and conditional upon full payment of the agreed compensation, government shares representing no more than 5% of the total shares outstanding could be traded in the first year, and no more than 10% during the following year, until the third year after lockup expiry, restrictions were removed completely. Under this general guidance set by the China Securities Regulatory Commission (CSRC), at the firm-level, government shareholders and the minority shareholders were allowed to negotiate with each other on the essential details of the compensation paid to minority shareholders, instead of following a rigid one-fits-all plan. The final plan would only be authorised by the CSRC when approved by at least two thirds of the minority shareholders in a firm. As a result of the firm-level negotiations, different firms came up with different amounts of compensation paid in various forms[1], and different lengths of lockup period in excess of or equal to the minimum 12-months required by the CSRC.

Within this process, it is clear that the first lockup expiry has the potential to provide new information, since this expiry signals that compensation has been paid and trade in government shares can take place (subject to the 5% trading restrictions). After this first expiry, other dates followed automatically (i.e. the 10% trading restrictions and then finally, expiry of all trading restrictions). However, an interesting observation is that many firms had more than one set of lockup expiry dates that were specified for their different types of government shareholders. In China, the government's shares were held by various agencies, for example state asset management bureaus, SOEs affiliated to the central government, and SOEs affiliated to the local government etc., and each of these had different motivations and incentive structures (Chen et al. 2009). The discrepancy amongst the government agencies further complicated the negotiation process. Within each individual firm, various agencies in many cases made commitments to lockup their shares for various lengths of time which resulted in multiple lockup expiry dates being written into the original reform agreements for any one firm.

Figure 1 graphs the timeline of the CSRC requirements and multiple lockup expiries at the firm-level.

[1] Compensation took various forms, either in shares, in cash, in pre-assigned rights, or a combination of more than one type. Compensation size also varied across firms (Zeng and McLaren, 2015).

Figure 1: Timeline (years) of the CSRC minimum requirements and the firm-level multiple lockups



3 Literature and Hypotheses Development

The CSRC carefully monitored firms as they approached the first pre-agreed lockup expiry date for each of their agencies, granting permission to those government shareholders who had fulfilled their compensation commitments by the time of the scheduled lock up expiry to unlock their shares (and thus be permitted to trade up to 5% of the total) or holding back those groups who didn't pay on time. Late payment could be due to a number of reasons[2]. For example, a certain government agency may have had difficulty meeting the financial obligations of the compensation. In other cases, late compensation could be due to an unwillingness to pay as a result of ongoing unresolved monetary disputes between government agencies in the same firm, with one agency not wanting to pay until the disputes had been settled. Late compensation could also be due to unresolved complaints from the minority shareholders against some of the government agencies who the shareholders believed had previously expropriated their interests, meaning that the minority shareholders were reluctant to accept the compensation payment, believing that it would signal that the previous disputes were resolved. Whatever the reason for non-payment at the agreed date, the CSRC would maintain the full lockup of the shares until the agency had satisfactorily fulfilled its responsibilities. As a result, there are first lockup expiry dates which are consistent with the agreement and executed precisely as planned, which we categorise as "*normal*" expiries, and for other agencies, first lockup expiry dates which "deviated" from the agreement due to some government agencies extending their lockup periods, which we categorise as "*abnormal*" expiries.

The *EMH* assumes that investors respond only to new information which comes to the markets in a random way. If the theory holds, investors would respond calmly around the "normal" lockup expiration dates because they knew exactly what would happen, like when the firms would announce lockup expiries and how much shares would be unlocked since all these had been written in the agreements. On the contrary, investors would be surprised around the "abnormal" lockup expiration dates because the information disclosed was different to what investors had expected.

Generally, the EMH, when considered in isolation, focuses on the information which delivers a clear message to investors. For example, studies of earnings announcements clearly show that investors react positively to unexpected good results and negatively to unexpected poor results (Brown et al. 1987; Rendleman et al. 1987). In many other cases, EMH may be considered in combination with other theories. For example, many studies investigate the market reactions around seasoned equity offerings to test the ISH which suggest that equity issues provide a negative signal, based on the argument that managers have superior information compared to investors

[2] Not every company would provide a reason. Those who provided reasons would include them in the proposals released on the announcement days of the lock-up expiries. We've summarised the mainly mentioned reasons in the proposals here and assumed that these reasons covered most of the cases.

(Scholes 1972; Jensen-Mecking 1976; Ross 1976; Mikkelson and Partch 1985; Masulis and Korwar 1986; Barclay and Litzenberger 1988; Errunza and Miller 2003 etc.).

A joint *information signalling theory* assumes that investors could subjectively perceive and interpret the corporate actions as different (unexpected) "signals" and react accordingly. In our context, the theory suggests that investors may take initiatives to "read between the lines" at the expiry dates and thus conjecture some implications. Previous studies presume that corporate characteristics, such as transparency and governance, instead of corporate actions, are perceived by the investors as signals of firm quality at the time of lockup expiry (for example, Liao et al. 2011). We argue that investors are more motivated to interpret corporate actions on the announcement days rather than pre-known corporate characteristics.[3] In our argument, corporate actions send out instant and timely signals on the lockup expiration days while corporate characteristics deliver the same (pre-known and indirect signals) on a continuous basis. Investors would view a "normal" lockup expiration as a precise execution of the agreement and an "abnormal" lockup expiration as a "deviated" execution, where a "precise" or a "deviated" execution indicates how powerful the minority investors of a firm are when they bargain for what they want from the government shareholders, in this case to execute the agreement to their expectations.

According to Firth et al. (2010) and Liu et al. (2014), the bargaining powers of large minority shareholders, the mutual funds in China, were explicitly weak and marginalised under the pressure from the government during the SSSR negotiation. However, the minority shareholders successfully coerced the government to negotiate and to reach agreements regarding compensation. This fact itself demonstrates that the minority shareholders are not as weak as previously thought. The government learnt this lesson after its first attempt in 2001 to sell government shares when the minority shareholders in response withdrew from the markets. Consequently the stock market slumped by around 40% and the damage lasted for four years until the government initiated the SSSR negotiation process (Khurshed et al. 2015; Zeng and McLaren 2015). Therefore, although the minority shareholders may compromise to some extent on some specific compensation terms during the SSSR negotiation, they consistently represent a "default threat" to the government We categorise the "default threat" as the "implicit bargaining power (IBP)" of minority shareholders and distinguish it from the "explicit bargaining power (EBP)" during the negotiation as discussed by Firth et al. (2010), Li et al. (2011) and Cumming and Hou (2014).

A few studies propose that the IBPs of the involved parties in a bilateral relationship will eventually end up with equilibrium in the name of "implicit contracts", voluntary and self-enforcing long-term agreements made between two parties, such as supplier-customer relationships (Helper et al. 1995; Nakaruma et al. 2011), employee/executive-firm relationships (Gillian et al. 2009), and stakeholder-corporation relationships (Gerwin et al. 2008). In other words, the two sides of an "implicit contract" test the boundaries of each other and after a few trials they understand the relative boundaries as well as the potential consequence if these boundaries are breached (the default threat). With this mutual understanding, the two parties can finally reach an equilibrium stage at which they volunteer to show a certain respect for each other and perform within each other's boundaries. This is different from the "written contract" which specifies the details of "dos and don'ts" with regards to a particular case. The mutual understanding in the "implicit contract" builds the foundation for a "written contract" to take effect. In our context, the "implicit contract" between the minority shareholders and government shareholders after the secondary privatisation influences how the government shareholders execute the "written agreement" at the lockup expiration day. The minority shareholders who have stronger IBPs in the "implicit contract" would pose a bigger "default threat" to the government shareholders who would then feel a higher urgency to execute the agreement precisely as planned, and vice versa.

Therefore we argue that the "normal" expiry dates send out a signal that the minority shareholders have strong IBPs against the government counterparty while the "abnormal" expiration dates deliver the opposite signal. As a result, the investors would respond favourably to "normal" lockup expiry days but negatively to the "abnormal" lockup expiry days.

Before we make any hypotheses, we understand there are multiple lockup expiry dates at the firm level and it is essential for us to differentiate the first and the subsequent lockup expiry dates. In the prior literature investigating a series of announcements relevant to the same corporate actions, there is evidence that the first announcement is supposed to informationally dominate the subsequent announcements unless the subsequent announcements carry

[3] In our argument, corporate actions are instant and timely although we recognise that these actions may be affected by the corporate characteristics to some extent.

additional information (Lee 1997; Ramnath 2002; Huang et al. 2016). Therefore we expect the first lockup expiry is more informative concerning the "IBP" of monitory investors than the subsequent lockup expiries. We assume that the first "normal" lockup expiry would please the market with a strong IBP signal while the first "abnormal" expiry would surprise the market with the deviation from the initial agreement and therefore arouse investors' initial concerns about the minority investors' IBPs. We then propose Hypothesis 1 as follows:

Hypothesis 1 (H1): *"Normal" expiries indicate that minority investors have stronger IBP than investors in firms with "abnormal" expiries. Therefore stock prices will react more positively to FIRST "normal" lockup expiries than FIRST "abnormal" lockup expiries.*

Next we will check whether there is any additional information implied in the subsequent first lockup expiries relating to further government agencies within a firm. In other words, we are interested to investigate whether the signal of "IBP" remains constant across all expiries or whether there are any information changes which would incentivise the investors to readjust their perceptions and interpretation over time and then influence their reactions accordingly.

An important issue worthy of attention in this case is that the number of subsequent lockup expiry dates varies from company to company. For instance, some companies may have zero or one subsequent first lockup expiry, while some others may have two, or three or even more than ten subsequent first lockup expiry dates, depending on the number of government agencies involved (see Table 1 below). If we pool all subsequent lockup expiry dates, those companies with more subsequent lockup expiries may be over-weighted and thus lead to biased results. In order to equally weight each company involved, we only focus on the first lockup expiry date for the final agency within each firm..

Each of the final of the first lockup expiry dates, "normal" or "abnormal", indicates a full lift of the illiquidity on state-owned shares, which is additional information. Therefore we assume the last lockup expiries, irrespective of "normal" or "abnormal", signal a full relief for the policy makers as well as an end to uncertainty for investors. And we make our hypothesis 2 accordingly:

Hypothesis 2 (H2): Stock prices will react more positively to the LAST lockup expiries than to the FIRST lockup expiries, regardless of whether they are "normal" or "abnormal" lockup expiries.

Regarding the signal of IBP, the subsequent lockup expiry dates, if consistent with the "normal" or "abnormal" category of the first lockup expiry, don't provide any additional information about the "IBP" of minority investors. And those subsequent lockup expiries that are contrary to the corresponding "normal" or "abnormal" first lockup expiries provide contrary information and should influence the market accordingly.

A change from "normal" first lockup expiry to "abnormal" last (of the first) expiry indicates the IBP of minority investors weakens and a change from "abnormal" to "normal" indicates the IBP of minority investors improves. The market would respond more favourably to an "abnormal to normal" change than a "normal to abnormal" change. We then construct our hypothesis 3 below:

Hypothesis 3 (H3): The stock prices will react more positively to an "abnormal to normal" change than to a "normal to abnormal" change.

The literature suggests that ownership type affects market reactions around lockup expiries (Field and Hanka 2001; Hakim et al. 2012). According to Cornett et al. (2007), banks and insurance companies are labelled "pressure sensitive" investors as they are more likely to have potential business relations with firms and less willing to challenge management decisions. Firth et al. (2010) pointed out that mutual fund firms in China are mostly indirectly or directly controlled by the Government-owned banks, securities companies, and also regulated and supervised by the CSRC which also decides the appointment and removal of senior fund managers. As evidence, they found that mutual funds had weak bargaining power which, under pressure from the government, was compromised during the negotiation process. We then propose that the mutual funds are pressure-sensitive and their ownership impairs the IBP of minority shareholders in general.

Hypothesis 4 (H4): mutual fund ownership negatively affects the market reaction around every lockup expiration date.

4 Data and Methodology

Our paper includes all the lockup expiries of as many as participating firms as possible, subject to the availability on WIND. Our full data covers from 2006 until 2015 and consists of 1161 firms and 3863 observations of lockup expiries, due to the existence of multiple lockup expires in the majority of firms. According to Table 1, 86.82% of the firms have more than one lockup expiry and 64.69% have at least three lockup expiries. Given the overwhelming scale, the phenomenon of multiple lockup expiries should be taken seriously and examined carefully.

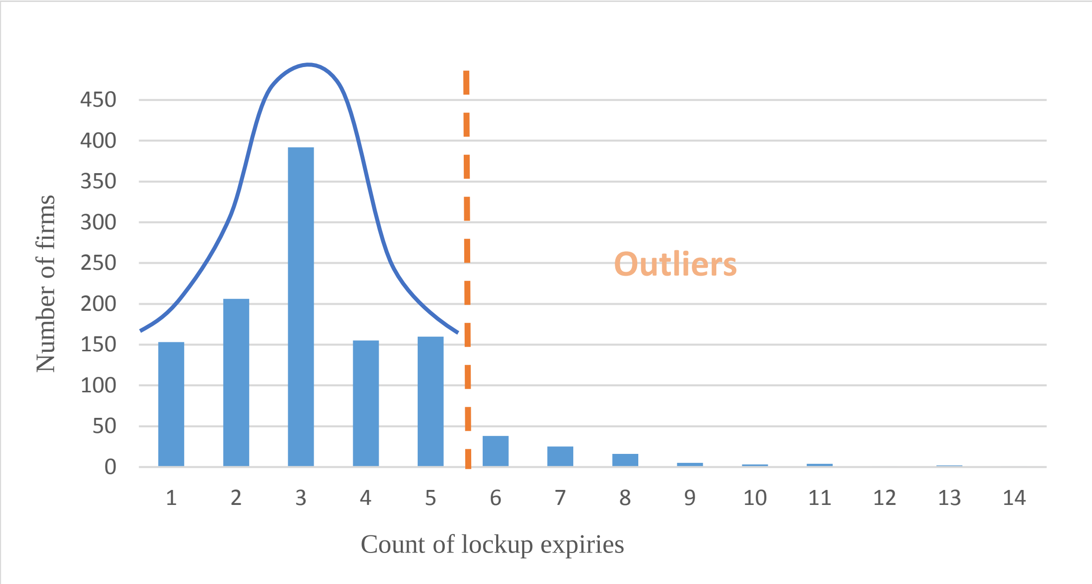
Table 1: Multiple lockup expiries

Number of Different Lockup expiries dates	**Number of observations**	**Number of firms**	**% of the total**	**Cumulative %**	**Cumulative %** *At least N lockup expiries*	
1	153	153	13.18%	13.18%	*At least 1*	100%
2	412	206	17.74%	30.92%	*At least 2*	**86.82%**
3	1176	392	33.76%	**64.69%**	*At least 3*	69.08%
4	620	155	13.35%	78.04%	*At least 4*	35.31%
5	800	160	13.78%	91.82%	*At least 5*	21.96%
6	228	38	3.27%	95.09%	*At least 6*	8.18%
7	175	25	2.15%	97.24%	*At least 7*	4.91%
8	128	16	1.38%	98.62%	*At least 8*	2.76%
9	45	5	0.43%	99.05%	*At least 9*	1.38%
10	30	3	0.26%	99.31%	*At least 10*	0.95%
11	44	4	0.34%	99.66%	*At least 11*	0.69%
12	12	1	0.09%	99.74%	*At least 12*	0.34%
13	26	2	0.17%	99.91%	*At least 13*	0.26%
14	14	1	0.09%	100.00%	*At least 14*	0.09%
Total	**3863**	**1161**	**100%**			

4.1 Overall sample

According to Figure 2, the distribution of the number of lockup expiries is positively skewed, indicating that there are some extreme cases which may lead to biased results if included. Our objective is to investigate the situation and draw some general conclusions. We therefore omit those firms which have six or more lockup expiries (8.18% of the total) so as to have a more normally distributed histogram as the bell-shaped curve indicates in the figure below. Our final sample contains 1066 firms (91.82% of the total) and 3161 observations, including firms which have five or fewer lockup expiry paths.

Figure 2 Histogram of Lockup Expiries



In order to classify "normal" and "abnormal" expiries, we check each sample firm's actual (first) lockup expiry dates for each government agency against the stated lockup expiry dates in their agreements and define those expiry dates which are consistent with the agreement as "normal" expiries, and those which deviated from the agreement as "abnormal" expiries. As a result, we have two categories, "normal" expiries and "abnormal" expiries.

Table 2: First and Last "Normal" Lockup Expiries and "Abnormal" Lockup Expiries

Sequence of Lockup expiries	**Number of Observations**			**% of the total**	
	Normal expiries	**Abnormal expiries**	**Total**	**Normal expiries**	**Abnormal expiries**
Full Sample	1726	1435	**3161**	**54.60%**	**45.40%**
First agency expiry	770	296	**1066**	**72.23%**	**27.77%**
Last agency expiry	441	472	913	**48.3%**	**51.7%**
Total	1211	768	**1979**	**61.19%**	**38.81%**

Characteristics of last lockup expiries		
Types	**Number of observations**	**Percentage**
Consistent with First	578	**63.31%**
Inconsistent with First	**335**	**36.69%**
• *Normal to Abnormal*	288	85.97%
• *Abnormal to Normal*	47	14.03%

Table 2 shows that there are 1726 "normal" expiries (54.60%) and 1435 "abnormal" expiries (45.40%). 72.23% of the first lockup expiries are "normal" and 27.77% are "abnormal". But the picture is more balanced when we come to the last lockup expiries, with 48.3% "normal" and 51.7% "abnormal". In other words, if a firm has a series of lockup expiries, the "normal" expiries tended to occur at an earlier stage than the "abnormal" expiries. There are 1066 observations for the first lockup expiry but only 913 observations for last lockup expiry since 153 firms have only one lockup expiry. The resulting sample consisting of both first and last expiries has a total of 1979 observations.

Furthermore, 63.31% of the last lockup expiries carry the same information as the first lockup expiries (normal-normal or abnormal-abnormal) and therefore supposedly offer no-surprise to the market. The remainder, 36.69%, of the last lockup expiries (335 observations) carry the opposite information (normal-abnormal or abnormal-normal) and are expected to stir the market in the opposite way from the first lockup expiries.

4.2 Event study

The classic method of the event study is applied in this paper to examine market reactions on lockup expiry days. Although there is no unique structure for an event study, we follow Binder (1998) and Campbell et al. (1993) to design an event-study so as to meet our research objectives.

4.2.1 Estimating excess returns

First we follow most empirical literature to use the event-study to apply the OLS market model to estimate excess returns (Mikkelson and Partch 1985, 1986; Loderer et al. 1991; Errunza and Miller 2003 etc.). In the theoretical literature, the OLS market model is also recommended for providing more precise inferences than other models (Campbell et al. 1993) and relying less on strong assumptions like jointly multivariate normal, independently and identically distributed variables through time, and cross-sectionally independent variables across securities (Brown and Warner 1980, 1985; Mikkleson and Partch 1988; Boehmer et al. 1991; Corrado 1989; Corrado and Zivney 1992).

There are some alternative models which are not the most appropriate for this study. First, the simplest mean-adjusted model may produce downward biased results in the presence of cross-sectional dependence (CSD) (Chandra et al. 1990). Studies also find that even relatively moderate CSD could cause Type I errors (Salinger 1992; Aktas et al. 2007; Kothari and Warner 2007; Kolari and Pynnönen 2010). CSD amongst Chinese listed firms is a big concern (Zeng and McLaren 2015), which justifies our decision to rule out the use of the simple mean-adjusted model. Second the use of the capital asset pricing model (CAPM) was common in event studies of the 1970s. However, the CAPM results may be sensitive to the restrictions imposed by the CAPM on the market model, which are questionable and may not be valid (Fama and French 1996). The risk can be avoided at little cost by using the OLS market model and therefore the use of the CAPM has almost ceased (MacKinlay 1997).

In general, the OLS market model estimator of the excess return is relatively unbiased (Binder 1998) and is applied here:

$\varepsilon_{it} = R_{it} - \alpha_i - \beta_i R_{mt}$, where α_i and β_i were the OLS values (parameters) from the estimation period of security i, R_{it} is the return of security i at time t, R_{mt} is the corresponding market return at time t and ε_{it} is the zero mean disturbance term (excess return).

It has been suggested that a broad-based stock index should be used for the market portfolio (Fama et al. 1969, Binder 1998). The sample companies are listed either on the Shanghai stock exchange (SHSE) or on the Shenzhen stock exchange (SZSE). Therefore we follow Zeng and McLaren (2015) to use SHSE A-Share Index and SZSE A-Share Index for firms listed in SHSE and SZSE respectively.

4.2.2 Aggregation of excess returns

The abnormal return observations are aggregated in order to draw overall inferences for the event of interest. The aggregation is along two dimensions, through time and across securities.

In line with Zeng and McLaren (2015), we define a three-day event window (-1, +1), covering the previous day, the announcement day (lockup expiry date) and the following day. The cumulative excess return (CER) is introduced to accommodate multiple sampling intervals within the event window (Campbell et al. 1993). CER (-1, +1) provides a short-run picture of the market reactions around our event of interest. We further calculate the long-run CERs which cover the whole year (31, 255) after the expiries for comparison.

We define $CER_{t_1-t_2}$ as the cumulative excess return for security i from t_1 to t_2 where $t_1 < t_2$, then $CER_{i(t_1-t_2)} = \sum_{t_1}^{t_2} \varepsilon_{it}$. Then the individual securities' CERs can be aggregated across securities as: $\overline{CER_{(t_1-t_2)}} = \frac{1}{N}\sum_{1}^{N} CER_{i(t_1-t_2)}$ where $\overline{\varepsilon_t}$ is the sample average of the N excess returns on day t.

4.2.3 Choice of estimation period

By convention, the preference for the estimation period usually includes one year before the event, such as from day -245 till day -6 relative to the event day (Brown and Warner 1980, 1985), from day -250 to day -30 (Atkas 2007) and from day -230 to day 131 (Liao et al. 2011). The choice of estimation period is somewhat arbitrary and barely justified (Aktas 2007).

Another line of research finds that beta stationarity increased with the calendar period length but did not increase indefinitely (Theobald 1981). In the literature, there is no consensus about how long an estimation period should take to achieve a stable beta and the choice varies with choices of countries, sample periods and returns intervals (monthly or daily returns) (Theobald 1981; Daves et al. 2000; Diacogiannis and Marki 2008; Xia et al. 2006). Meanwhile confounding events would also contaminate the estimation periods and lead to less meaningful beta estimates (Fuller et al. 2002).

Therefore we aim to select an estimation period which provides a relatively stable beta and which simultaneously has no significant confounding events. The last decade in China represents the final critical stage of the Chinese economic transition which has witnessed significant changes. Consequently in our study an estimation period greater than one year would confound with the SSSR and is not advised. However a one-year estimation period would just cover the minimum 12-month lockup period which provided a relatively stable period for firms to operate and probably help to yield a more stable beta. As a result, a one-year estimation period for our sample firms is probably the most appropriate choice compared to the other alternatives. Considering the potential impact of information leakages (or rumours) before the announcement, we also follow Aktas et al. (2007) to exclude 30 days between the end of the estimation period and the lockup expiry to neutralize the impact. The final estimation period therefore covers eleven months before the lockup expiry (-255, -31).

4.3 OLS pooled regression models

We also run pooled OLS regressions to further examine our hypotheses. Because what we have are panel data, we have to consider the possibility that the OLS standard errors can be biased if there is time-series correlation (firm-effect) or/and the cross-sectional correlation (time-effect) in residuals. In the finance literature, according to Peterson (2009), 42% of the papers reviewed ignored this problem and the others arbitrarily chose a solution which was often incorrect and rarely explained. He then examined different methods in varied situations and explained the similarities and differences.

If these two effects[4] are co-existent, the finance literature suggests that the OLS model is applied, the time dimension is estimated parametrically by including time dummies and then standard errors are clustered by firm given the number of firm observations is usually in excess of the number of time periods (Anderson and Reeb 2003 Sapienza 2004; Faulkender and Petersen 2006 etc.). However, the OLS model may yield less efficient parametric estimates than the more efficient models, such as fixed-effect, GLS or GMM. Petersen (2009) then suggests using a more efficient model with standard errors clustered by firm and time dummies in order to obtain less biased standard errors and more efficient estimates.

The endogeneity problem, which is a concern in the empirical corporate finance literature, is not a serious issue here. First the “normal” expiries were pre-determined in the reform proposals and impossible to be affected by the market. Second the “abnormal” expiries indicate that the involved government agencies didn’t fulfil their commitments and this was exogenous to the market.[5]

[4] The residuals of a given firm may be correlated across years (time-series dependence). Petersen calls this a firm effect. The residuals of a given year may be correlated across different firms (cross-sectional dependence). Petersen calls this a time effect. If the firm-effect is fixed, firm dummies can completely capture the correlation across time. Similarly, if the time-effect is fixed, the time dummies completely remove the correlation between firms.

[5] The reasons given in the written documents regarding the delay in compensation are always linked to issues and problems within the firm or between the stakeholders, not the market. It is conceivable that there may be some market effect, but to a very small extent. The dominating or the deciding factor is exogenous.

Therefore we adopt the normal OLS model and same method as recommended in Peterson (2009) in order to control for the bias in the standard errors due to the potential correlation in the residuals.

4.3.1 Variables and regression models

We use CERs around each (first) lockup expiration day as our dependent variable on the left-hand side of our regressions. In order to test our hypotheses, we arrange our data in three groups, one full sample and two subsamples, and include four main independent variables.

First we examine the subsample consisting of FIRST lockup expiries only (FIRST sub-sample 1 with 1066 observations). We set a dummy which equals one when it is a "normal" expiry and zero when it is an "abnormal" expiry (*Dnorm*). Consistent with our *hypothesis 1*, we expect CERs around the FIRST "normal" expiry to be larger than those around the FIRST "abnormal" expiries and therefore positively related to the dummy. And the signals would be strengthened with the unlock size announced, that is, the market would respond more aggressively, either positively or negatively, to larger unlock-sizes (as a percentage of the total shares). We then interact this dummy with the unlock size at each expiration (*Unlock*) and expect the interaction term (*Dnorm* * *Unlock*) to be positively related to the CERs.

Second, consistent with our hypotheses development, we ignore all the middle lockup expiries and construct a sub-sample consisting of all LAST expiries only (LAST sub-sample with 913 observations). We then combine the FIRST and the LAST sub-samples (FIRST-LAST subsample with 1979 observations). We define a dummy (*Dlast*) which equals one when it is the last expiry and zero otherwise. We expect CERs are positively related to *Dlast* (*hypothesis 2*). We then interact each dummy with the lockup size, *Dlast* * *Unlock* and expect the interaction term to be positively related with the CERs.

Third we focus on the sub-sample consisting of LAST lockup expiries which carry the opposite information from the first lockup expiries (inconsistent sub-sample with 335 observations). In order to test our *hypothesis 3*, we define a dummy which equals one when there is an "abnormal to normal" change and zero where there is a "normal to abnormal" change (*Dcha*) and expect a positive coefficient on this dummy. We also interact this dummy with the unlock size at each expiry (*Unlock*) and expect the interaction term (*Dcha* * *Unlock*) to be positively related with the CERs too.

Finally we also include yearly mutual fund ownership (*MutHLD*) of each firm during the sample period and expect a negative relationship between this variable and CERs (*hypothesis 4*).

In addition, we follow the literature to include three conventional groups of control variables (Liao et al. 2011 etc.). The first control group includes firm characteristics such as firm size (*Size*), firm performance (*Perform*), firm leverage (*Lev*) and firm-level agency problem (*AP*), proxied by the ratio of government shares over public shares. The second control group includes popular corporate governance variables such as the proportion of independent board directors (*IndDir*), whether a chairman simultaneously takes a dual responsibility as the CEO (*Dual*), and the largest ten shareholder's ownership (*LargHLD*). The third group controls the market factors such as the listing exchange (*Exchange*) and the market performance (*Mktperform*). Moreover, we control for the industries using the CSRC 1st level industry codes and also control for the years. Appendix 1 lists and explains all the variables used in the regressions.

Here are the regression models applied in this paper:

- Regression model 1 for the sub-sample of First lockup expiries (*1066* observations) to test H1 and H4:

$$CER_i\ (-t,+t) = \alpha + \beta_1 Dnorm_i + \beta_2 Dnorm_i * Unlock_i + \beta_3 MutHLD_i + \beta \sum_{j=4}^{n} Controls_j + \varepsilon_i \quad (1)$$

- Regression model 2 for the combination of FIRST and LAST sub-samples to test H2 and H4 (*1979* observations):

$$CER_i\ (-t,+t) = \alpha + \beta_1 Dlast_i + \beta_2 Dlast_i * Unlock_i + \beta_3 MutHLD_i + \beta \sum_{j=4}^{n} Controls_j + \varepsilon_i \quad (2)$$

- Regression model 3 for the sub-sample of Last lockup expiries which are inconsistent with First lockup expiries to test H2 and H4 (*335* observations):

$$CER_i\ (-t,+t) = \alpha + \beta_1 Dcha_i + \beta_2 Dcha_i * Unlock_i + \beta_3 MutHLD_i + \beta \sum_{j=4}^{n} Controls_j + \varepsilon_i \quad (3)$$

We are aware that potential multicollinearity between the variables may affect the model specification and thus run the correlation matrix among all variables using Stata[6]. There is nothing worrying from this perspective. Most of the correlations are under 10% and the maximum correlation found is between *Unlock* and *MutHLD* (38.7%), which may not necessarily imply multicollinearity. In the unreported results, the VIF (variance inflation factor) statistics completely eliminate the concern.

5 Results and Analysis

In this section, we report the baseline results about the market performance (CERs with different event windows) as well as the regression results unfolding the drivers underlying the market performance.

5.1 Baseline results

5.1.1 Short-run market performance

We have mainly investigated the short-run market performance around the lockup expiries and report the findings in Table 3.

Table 3: The short-run cumulative excess returns

	N	ER0	CER(-1,1)
Full Sample	3161	0.0058***	0.0027***
Normal Expiries	1726	0.0055***	0.0024*
Abnormal Expiries	1435	0.0062***	0.0030*
Sub-sample: First Expiries	1066	0.0052***	0.0012
Normal Expiries	770	0.0054***	0.0009
Abnormal Expiries	296	0.0044***	0.002
Sub-sample: Last Expiries	913	0.0059***	0.0058***
Normal Expiries	441	0.0056***	0.0088***
Abnormal Expiries	472	0.0061***	0.003
Sub-sample: LAST inconsistent with FIRST	335	0.0052***	0.0066***
Normal to Abnormal (NA)	288	0.0085***	0.0046***
Abnormal to Normal (AN)	47	0.0047***	0.0067***

ER0:Excess return on the announcement day 0;
CER (-1,+1):cumulative excess return during the three-day event window covering day -1, day 0 and day +1;
*t statistics: *statistically significant at the 10% level 0.1, ** statistically significant at the 5% level , and *** statistically significant at the 1% level.*

The average three-day CER (-1, +1) based on the full sample (3161 observations) is 0.0027 (0.27%), significant at the 1% level. The "normal" group reports 0.0024 and the "abnormal" group reports 0.003, both statistically significant at the 10% level. And the excess returns on the announcement day (ER0) present a similar picture with

[6] The results are not reported here but available on request.

an ER0 of 0.0055 for the “normal” group and 0.006 for the “abnormal” group, both significant at the 1% level. The “normal” group displays a CER (-1, +1) smaller than the “abnormal” group, which generally rejects our fundamental hypothesis that the market responds more favourably to the “normal” expiries than the “abnormal” expiries due to its signal of stronger IBP. But the majority of firms have multiple lockup expiries which are pooled together in our sample. As a result, the pooling may dilute or obscure the real signal. We then divide our sample into sub-samples to examine the hypothesis in more detail.

First we focus on the FIRST expiries and assume that the subsequent lockup expiries don’t affect the market unless they carry additional information rather than the signal of IBP. We then examine the short-run market performance on the FIRST sub-sample which consists of all FIRST expiries and find that the ER0 and CER (-1, +1) are reported as 0.0052 (significant at the 1% level) and 0.0012 (insignificant) respectively. The difference between ER0 and CER (-1, +1) suggests the market reacted to the news instantly on the announcement day and then adjusted back to its routine average. This time the “normal” group reports a higher ER0 (0.0054) than the “abnormal” group does (0.0044), lending strong support to our *H1*. The fundamental hypothesis holds with the FIRST sub-sample, though fails with the total pooling sample. The “normal” group reports a lower CER (-1, +1) than the “abnormal” group (0.0009 vs 0.002), but both are insignificant. In this case, ER0 results are more informative than the insignificant CER (-1, +1) results. Furthermore it suggests that the post-announcement day witnesses a much more negative excess return for the “normal” group than the “abnormal” group, which reverses the higher ER0 for the “normal” group to the smaller insignificant CER (-1, +1). It could be simply due to that the market tended to overreact to the FIRST “normal” expiries on the announcement day and then adjust downwards to where it should be. It indicates the market perhaps over-reacted to the signal of stronger IBP sent out by the “normal” group and then calmed down in the three-day event window. Probably because the market was concerned by the uncertainties that firms starting with first “normal” lockup expiry announcements may come up with “abnormal” lockup expiry announcements later on.

Second we investigate the LAST sub-sample and compare the results with the above FIRST sub-sample results. The LAST group reports a higher ER0 (0.0059) than the FIRST group (0.0052), both significant at the 1% level. And the LAST group also reports a significant three-day CER (-1, +1) of 0.0058 while the FIRST group reports insignificant CER (-1, +1) of 0.0012. These findings support our *H2* that the last expiries in general signal a huge relief for both the government and the investors and also put a satisfactory ending to the long saga of unlocking government shares after the SSSR and therefore the market in general reacted more favourably to the last expiries than the first expiries. In addition, within the LAST sub-sample, the LAST “normal” group reports a higher CER (-1, +1), almost three times larger than reported by the LAST “abnormal” group (0.0088 significant at the 1% level vs 0.003 insignificant), but a slightly lower ER0 (0.0056 vs 0.0061). The discrepancy indicates the positive market reaction for the “normal” group persisted and intensified after the announcement day while the reactions for the “abnormal” group mostly concentrated on the announcement day. This also implies the market tended to underreact to the LAST “normal” expiries on the announcement day and adjust upwards to where it should be in the three-day event window. It seems the market responded more slowly to the signal contained in the “normal” expiries than in the “abnormal” expiries. In this circumstance, CER (-1, +1) is more accurate than ER0 in terms of capturing the real market response.

Third we check each last expiration against its corresponding first expiry to see if there is any change from “normal” first to “abnormal” last or the other way around. We then focus on the sub-sample consisting of those with changes only and further subdivide this “inconsistent” sub-sample into “normal to abnormal” (NA) sub-group and “abnormal to normal” (AN) sub-group. We find the “NA” sub-group reports a lower CER (-1, +1) than the “AN” sub-group (0.0046 vs 0.0067), both significant at the 1% level. This finding backs our *H3* that “AN” change signals an improvement in the IBP and thus should solicit more favourable market response. However the ER0 results show just the opposite with the “NA” sub-group displays a higher ER0 than the “AN” sub-group (0.0085 vs 0.0047), both significant at the 1% level. The market seems to overreact to “NA” change but underreact to “AN” change on the announcement day and then it adjusts to where they should be using the three-day event window. We thus rely more on the CER (-1, +1) results because we think the three-day event window captures the market response more accurately.

Overall, our general hypothesis holds with the sub-samples where the confounding effects from the multiple lockup expiries are removed. It confirms our proposition that the “normal” expiries signal stronger IBP of investors than the "abnormal" expiries and therefore evoke a more positive market response. And the market also saw through the improvement in terms of IBP over time and responded accordingly.

5.1.2 Long-run market performance

Apart from the short-run performance, we would also like to investigate the long-run market performance after the lockup expiries for comparison and a different perspective. We calculate the CERs covering one month after the lockup expiration till one year after that is 31 working days till 255 working days after the lockup expiration announcements. Table 4 reports the results for CER (31, 255) for our samples.

Table 4: The long-run cumulative excess returns

	N	**CER(31,255)**
Full Sample	3161	-0.0457***
Normal Expiries	1726	-0.0135
Abnormal Expiries	1435	-0.0838***
Sub-sample: First Expiries	1066	-0.0436**
Normal Expiries	770	-0.0269
Abnormal Expiries	296	-0.0884***
Sub-sample: Last Expiries	913	-0.0602***
Normal Expiries	441	-0.0127
Abnormal Expiries	472	-0.1041***
Sub-sample: LAST inconsistent with FIRST	335	-0.066***
Normal to Abnormal (NA)	288	-0.0826***
Abnormal to Normal (AN)	47	-0.0503***

*CER (31,255):long-run cumulative excess return covering from working day 33 till day 255 after the announcement; t statistics: *statistically significant at the 10% level 0.1, ** statistically significant at the 5% level , and *** statistically significant at the 1% level.*

Based on the full sample (3161 observations), the "normal" group reports insignificantly negative long-run CER (-0.0135), while the "abnormal" group reports a much more negative long-run CER significant at the 1% level (-0.0838). In other words, in the long-run, the "abnormal" expiries were related to negative "abnormal" performance while the "normal" expiries were related to normal performance.

Using the FIRST sub-sample (1066 observations), we are left with the same impression that the "abnormal" expiries led to undesirable long-run market performance (-0.0884 significant at the 1% level) while the "normal" expiries were linked with normal long-run performance (-0.0269 CER insignificant). The LAST sub-sample results reinforce this conclusion with an insignificantly negative long-run CER for the "normal" expiries (-0.0127) and a significant more negative long-run CER for the "abnormal" expiries (-0.1041).

When examining the "inconsistent" sub-sample, we find that both the "NA" and the "AN" sub-groups deliver significantly negative long-run CERs, -0.0826 and -0.0503 respectively. It indicates that the LAST expiries with changes from the FIRST group, regardless of whether it is a "normal to abnormal" change or an "abnormal to normal" change, were related to unfavourable long-run market performance. But the "NA" sub-group shows a more negative long-run CER than the "AN" sub-group, consistent with the same conclusion drawn with the previous samples that the "abnormal" expiries were connected with worse long-run market performance than the "normal" expiries.

This general conclusion with the long-run market performance implies that the market, in the long-run, unambiguously recognised that the "normal" expiries signal stronger IBP than "abnormal" expiries and therefore the "normal" expiries were related to better long-term performance, supporting our main hypothesis

5.1.3 Summary

It appears that the "normal" expiries indicate that investors have stronger IBP against the government while the "abnormal" expiries means relatively weaker IBP against the government. The market was also able to swiftly recognise and reflect improvements in the IBP if a firm switched from an abnormal to a normal expiry. Furthermore this perception by the market was persistent in the long-run as well.

5.2 OLS regression results

The regression results will help us to understand the driving factors underlying the short-run and long-run market performance.

5.2.1 Descriptive statistics

Table 5 reports the descriptive statistics for all the numerical variables applied in this paper. We compare the results from the full pooling sample, the FIRST sub-sample and the LAST sub-sample. The mean of unlocked size at each expiration is 10.27% with the full sample, but 4.63% with the FIRST sub-sample and as large as 18.88% with the LAST sub-sample. The pattern shows that the government attempted to unlock fewer shares at the beginning but many more when approaching the end of the process. This generally complies with the requirements set by the government in the original proposal to restrict the sales of government shares up to 36 months after the SSSR.

Table 5: Descriptive statistics of the variables

	The full polling sample				
	Mean	**Median**	**SD**	**Max**	**Min**
Unlocked	0.1027	0.05	0.132	0.7237	0
MulHLD	0.10065	0.01345	0.1692	1.16975	0
Size	21.7274	21.6888	1.3312	28.5075	15.7152
Leverage	0.5549	0.5375	0.3945	11.5097	-0.1947
ROE	0.83785	0.10515	23.88515	758.55635	-14.1984
Dual	0.1403	0	0.3473	1	0
IndDir	0.3641	0.3333	0.053	0.6667	0.0909
LargHLD	0.0669	0.03175	0.09945	1.4487	0.00255
MktPerform	0.00405	0.00795	0.035	0.1045	-0.1316
	First sub-sample				
	Mean	**Median**	**SD**	**Max**	**Min**
Unlocked	0.0463	0.05	0.0392	0.3807	0.0001
MulHLD	0.0739	0.0067	0.1253	0.8514	0
Size	21.5624	21.538	1.2597	28.3576	15.7152
Leverage	0.5585	0.53	0.474	11.5097	0.0108
ROE	0.75	0.0692	22.448	713.2036	-12.7601
Dual	0.1366	0	0.3436	1	0
IndDir	0.3615	0.3333	0.0502	0.6	0.1818
LargHLD	0.0452	0.0204	0.0703	1.1372	0.0018
MktPerform	0.004	0.0069	0.0247	0.0652	-0.0919
	Last sub-sample				
	Mean	**Median**	**SD**	**Max**	**Min**
Unlocked	0.2027	0.1888	0.1626	0.7237	0.0001
MulHLD	0.0535	0.0135	0.0878	0.6367	0
Size	21.9483	21.8725	1.3705	28.5075	15.7294
Leverage	0.5403	0.5368	0.2894	5.7783	-0.1947
ROE	0.1757	0.0719	2.8743	90.7055	-2.8766
Dual	0.1366	0	0.3436	1	0
IndDir	0.3681	0.3333	0.0534	0.5714	0.2
LargHLD	0.0434	0.0227	0.0583	0.623	0.0015
MktPerform	0.0001	0.0021	0.0206	0.0786	-0.0794

Unlocked: *The percentage of shares expired in each expiry date;* ***MulHLD****: The percentage of shares held by the mutual funds;* ***Size****: The natural logarithm of the total assets of the year before;* ***Leverage****: The ratio of total liability to total assets of the year before;* ***ROE****: Return on equity the year before;* ***Dual****: Dummy variable. If in the previous year, the chairman of the directors' board and the CEO are the same person, the variable equals 1; otherwise, 0;* ***IndDir****: The percentage of independent directors of the year before;* ***LargHLD****: The percentage of shares held by the first shareholder of the year before;* ***MktPerform****: The annual market-adjusted stock return.*

Mutual funds held on average 7.39% of the total shares with the FIRST sub-sample and 5.35% with the LAST sub-sample, comparable to the reported level of mutual funds' ownership in the US (Yuan et al. 2008) and also in accordance with the strategic decision made by Chinese Government since 2000 to develop mutual funds as institutional investors apart from the state-owned banks and financial institutions. From the table, we see the mutual fund ownership decreases by around one quarter from the First to the Last sub-sample. Given the mutual funds in China are always criticised as being directly or indirectly connected with Chinese government-level authorities (Firth et al. 2010), it indicates that the mutual funds shrank their relative shareholding as the firms went through the lockup expiry process.[7]

There is not much difference with the control variables between the two sub-samples except the *ROE* and the annual market adjusted stock returns (*MktPerform*). The mean *ROE* decreases hugely from the FIRST to LAST sub-sample (from 0.7500 to 0.1757) while the medians remain at the same level. It maybe because the equity value of the government shares used to be estimated using the book value since officially the government shares were not allowed to be traded on the market before the SSSR. However around the last expiries, most of firms have already unlocked a decent size of the government shares which therefore valued at the market price rather than book price. The *MktPerform* also decreased enormously probably because many last expiries overlapped with the global financial crisis.

5.2.2 Regressions against the market performance

We perform the regression analysis and report the regression results in Table 6.

- Model 1

Model 1 is based on the FIRST sub-sample (1066 observations). When regressed against CER (-1, +1), the coefficient of dummy *Dnorm* is negative (-0.0111), significant at the 10% level, which is contrary to our expectation of a positive relationship, rejecting our *H1*. The CER (-1, +1) results analysed in section 5.1, though insignificant, show that the "abnormal" expiries have a higher mean CER (-1, +1) than the "normal" expiries and therefore there is no surprise to find a negative connection between CER (-1, +1) and the dummy *Dnorm* in the regression. But the interaction term *Dnorm * Unlock*, however, has a positive coefficient estimate of 0.1379, significant at the 5% level, consistent with our expectation. Given *Unlock* has a positive coefficient estimate of 0.0247, the coefficient on the interactions term means the "normal" expiries strengthen the positive impact of *Unlock*, and therefore indirectly have a positive impact on the CER (-1, +1) and thus it lends some support, though not strong support, to *H1*. Neither *Dnorm* nor *Dnorm * Unlock* are statistically significant factors when regressed against ER0 or long-run CER (31, 255).

The coefficients on *MulHLD* report negative (-0.0065) with ER0 but positive (0.0057) with CER (-1, +1), however both are insignificant. The coefficient becomes a definite negative (-0.300) and statistically significant with CER (31, 255), consistent with our *H4*. It seems the negative impact of mutual fund ownership is unnoticeable and ambiguous in the short-run but becomes apparent and definite in the long-run.

- Model 2

Model 2 is based on the combination of the FIRST and the LAST sub-samples (1979 observations). When the dependant variable is CER (-1, +1), the coefficient on the dummy *Dlast* is 0.0137, statistically significant at the 1% level, consistent with our expectation. And the interaction term *Dlast * Unlock* also has a significant positive coefficient (0.0283), in accordance with our expectations too. The combination supports our *H2* strongly. Both variables show insignificant coefficients when regressed against ER0, but report larger and more significant coefficients when regressed against CER (31, 255), which means, *H2* is robustly supported even in the long-run. The impact of *Dnorm* is insignificant with all the dependant variables, indicating that in this case, where it is a "normal" or "abnormal" expiration is not as important as whether it is a "first" or "last" expiration.

[7] The mutual funds were controlled by the government-owned organisations which also held shares in the listed companies. When these organisations sold their share in a state-owned company to the market, the mutual fund were following their examples. It is probably because mutual funds, when holding shares in a listed SOE together with the controlling government organisations, would have advantages in that listed SOE due to the connection. Once the government organisation was out or gestured to get out, the advantages they used to have disappeared or were likely to disappear. Thus they might want to withdraw accordingly.

The coefficients on *MulHLD* imply a similar story as the Model 1 suggests that its impact is trivial in the short-run but turns to a very negative power in the long-run with a coefficient estimate of -0.6715 statistically significant at the 1% level, which indicates that *H4* is strongly supported in the long run.

- Model 3

Model 3 is based on the sub-sample of last expiries with changes (335 observations). The coefficients on the dummy *Dcha* are all positive and statistically insignificant no matter which dependant variables is regressed against, which means the dummy on its own is not as critical as we expect. Then we move to the coefficients on the interaction term *Dcha * Unlock*, which are all positive but, again, statically insignificant. The signs of all the coefficients on the interaction terms support our *H3*, but impaired by the insignificance of the coefficients. The regression results suggest that *H3* holds with our sub-sample but are not strongly supported. The coefficients on *MulHLD* repeat the same story as the previous models reveal and indicate that *H4* is supported in the long-run CER (31, 255).

For all the three models, the value of adjusted R-squared increases with the length of the event windows, indicating the variables chosen are more meaningful with longer event windows.

Table 6: The OLS regression results

	Model 1			Model 2			Model 3		
	ER0	**CER(-1,1)**	**CER(31,255)**	**ER0**	**CER(-1,1)**	**CER(31,255)**	**ER0**	**CER(-1,1)**	**CER(31,255)**
DNorm	-0.0013	-0.0111*	-0.0284	-0.0002	-0.0029	-0.0601			
DNorm×Unlocked	0.0476	0.1379**	0.0273						
Dlast				0.0021	0.0137***	0.2188***			
Dlast×Unlocked				0.0017	0.0283*	0.3022**			
Dcha							0.0052	0.0083	0.0392
Dcha×Unlocked							0.0086	0.0367	0.0843
Unlocked	0.0097	0.0247***	0.3419***				0.0076	0.0365**	0.3899***
MulHLD	-0.0065	0.0057	-0.3000*	-0.0039	0.0191	-0.6715***	-0.0041	0.0193	-0.6418***
Size	0.0025**	0.0023	-0.0012	0.0002	-0.0015	-0.0289**	0.0001	-0.0016	-0.0305**
Leverage	-0.0025	-0.0031	-0.1070***	-0.0041	-0.0136**	0.0298	-0.0045	-0.0143**	0.0338
ROE	0	0.0001	0	0.0007	0.0002	-0.0139**	0.0006	0.0002	-0.0144**
Dual	-0.0003	-0.001	-0.0814	-0.0067*	-0.0086	0.0453	-0.0066*	-0.0083	0.0443
IndDir	0.0111	-0.0078	-0.1182	-0.0252	-0.0215	-0.1452	-0.0238	-0.019	-0.1178
LargHLD	0.005	0.0223	0.0059	-0.0353	-0.0397	-0.48	-0.0378*	-0.0445	-0.6458**
Exchange	-0.0026	0.0054	0.0415	-0.0031	0.0009	-0.0414	-0.0027	0.0014	-0.0405
MktPerform	-0.0194	-0.1237	1.5237**	-0.0023	0.0721	-0.613	-0.0022	0.067	-0.625
Industry	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Constant	-0.0882**	-0.0463	-0.6962	0.0465	0.0708	1.1984***	0.0456	0.0683	1.1759***
Adj-R^2	-0.003	0.028	0.075	0.012	0.009	0.1	0.013	0.01	0.104

*t statistics: *statistically significant at the 10% level 0.1, ** statistically significant at the 5% level , and *** statistically significant at the 1% level;*
Please refer to appendix 1 for the definitions of all the variables.

5.2.3 Robustness check

In this sub-section, we vary the length of the event windows of CERs for the robust checks. For example, we regress the core variables against CER (-2, +2), CER (-3, +3), CER (-5, +5), CER (-10, +10), CER (-15, +15), CER (-20, +20), CER (-25, +25) and CER (-30, +30) respectively and report the results in appendix 2.

- Model 1

Based on Model 1, the coefficients on dummy *Dnorm* are all significantly negative across all event windows. The interaction term *Dnorm * Unlock* persistently shows a significant positive coefficient with an event window shorter or equal to (-5, +5) but the significance disappears with a longer event window. The results reinforce what we have derived previously with the Model 1 that *H1* is not directly supported by the regression results, but partially and indirectly supported with the event windows no longer than (-5, +5).

- Model 2

The dummy *Dlast* and the interaction term *Dlast * Unlock* have positive coefficients with all the event windows we test and therefore strongly support our *H2*.

- Model 3

The dummy *Dcha* reports significant and positive coefficients with event windows equal to or longer than (-3, +3), which unambiguously supports our *H3*. Meanwhile the coefficients on the interaction term *Dcha * Unlock* are positive with all the event windows, but significant only with CER (-2, +2) and CER (-15, +15).

Additionally the coefficient on the variable *MulHLD* are all insignificant. The results are consistent across all three models and all the event windows tested, which indicates the mutual fund ownership is not a driving factor underlying the short-term market performance.

5.2.4 Summary

The regression results provide an opportunity to further examine baseline results and the hypotheses made. Generally speaking, *H1* is partially supported with the Model 1 results, *H2* is strongly and robustly supported despite of any variations or adjustments made about Model 2, *H3* is supported with the Model 3 results but slightly impaired by the insignificance of the coefficients reported with a few event-windows CERs, while *H4* is universally supported with the long-run event window.

6 Conclusion

This paper investigates the market performance around the lockup expiries of the Chinese government shares after the secondary privatisation in China in 2005. Due to the unique feature of the Chinese SSSR, the whole picture is complicated with the popularity of multiple lockup expiries, which exist for the vast majority of the sample firms and vary from firm to firm. Due to this complexity, there is limited research about the lockup expiries after the SSSR in China except for Liao et al. (2011) which uses incomplete one-year data and ignores the existence of multiple lockup expiries. More generally speaking, this type of research on the market reactions around the lockup expiries after a critical event, such as IPO or SEO, is under-investigated in the literature, which mainly attempts to explain the abnormal market reactions from a perspective of market inefficiencies or from a view of "permanent" signal constantly sent out by firms (Field and Hanka 2001, Hakim et al. 2012, Liao et al. 2011). In this paper we have critically discussed the previous theories and propose that the market reactions should be examined with a deep understanding of the characteristics of the event itself, such as the terms and conditions specified relative to the resulting lockup expiries and by doing so the explanations put forward are based on a customised close investigation and therefore are more likely to be plausible and convincing. We then make our own hypothesis, which fits into our specific context in China. We categorise "normal" and "abnormal" first lockup expiries, with the "normal" expiries conforming to the dates written in the original proposals and the "abnormal" expiries deviating from the proposals. We argue that the "normal" expiries indicate the investors have stronger implicit bargaining power against the government while the "abnormal" expiries mean the opposite. We are the first to use the term "implicit bargaining power" which is derived from the "implicit contracts" from management research. We believe that the investors in China, although they do not appear to be very powerful when viewed from the outside in the short-term, are actually passively aggressive in the long-term and powerful enough to negotiate with the government to achieve what they desire. And we also argue that the Chinese market can see through this and react accordingly. This study looks into the market reactions around the lockup expiries after the SSSR and helps us to find out whether our argument is supported or not.

We estimate the CERs with different event windows and also run the regression models to examine our main hypothesis that "normal" expiry dates indicate that minority investors have stronger implicit bargaining powers than investors in firms with "abnormal" expiry dates. We find that our hypothesis doesn't hold with the full pooling sample which is contaminated by noise from the existence of multiple lockup expiries, but generally holds with our sub-samples consisting of first or last expiries only. In general, the short-run CERs are higher for the "normal" expiries than the "abnormal" expiries. We also find the long-run CERS results persistently support our main hypothesis. Additionally the market is wise enough to even react to the improvements in the implicit bargaining power, signalled by the change from the "abnormal" first to the "normal" last expiries. Furthermore we test the impact of mutual fund ownership and conclude that its impact is almost invisible in the short-run but exerts a strong negative effect in the long-run.

We contribute to the literature from the following two aspects. First we complete the data and are the first to consider carefully the phenomenon of multiple lockup expiry dates. We are the first to capture a full picture of lockup expiries after the privatisation. Second we are the first to propose the term of "implicit bargaining power" of investors to explain the market reactions observed in China around lockup expiry dates and this is supported generally by our results. Previous literature tends to refer to universal reasons underlying the market reactions but we suggest customising the investigation to the particular events in particular environments before putting forward any plausible explanations. Specifically, we hypothesise that deviations from the actual dates specified in the original agreements signal future performance, which is empirically supported with our evidence. Further research may be required to investigate how the market responds around the announcements of the real sales of government shares in order to extend our findings relating to the announcements of lock-up expiries.

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Appendices

Appendix 1

The Definition of Variables

Variable	Definition	Measurement
$CER_i\ (-t,+t)$	Cumulative excess returns.	Using the market model to estimate the expected rate of return, day 0 is expiry date. From day –t to +t is the event window.
Dnorm	Normal expiries	Dummy Variable. If the expiry date is the same as the date set in the reform announcement, the variable equals 1; otherwise, 0.
Unlocked	Scale of expiration	The percentage of shares expired in each expiry date.
Dcha	Change from the first to the last expiration	Dummy which equals 1 when there is a “abnormal to normal” change and 0 where there is an “normal to abnormal” change
Dlast	The last expiry date.	Dummy variable. If the expiry date is the last one of the series expiry dates, the variable equals 1 and 0 otherwise.
MulHLD	The mutual fund ownership	The percentage of shares held by the mutual funds
IndDir	Independence of directors board	The percentage of independent directors in the previous year.
Dual	Separation of chairman and CEO	Dummy variable. If in the previous year, the chairman of the directors’ board and the CEO are the same person, the variable equals 1; otherwise, 0.
LargHLD	Largest ten shareholder’s holdings	The percentage of shares held by the largest ten shareholder in the previous year.
Size	Size of assets	The natural logarithm of the total assets in the previous year.
Lev	Financial leverage	The ratio of total liability to total assets in the previous year.
ROE	Profitability	Return on equity in the previous year..
MktPerform	Market performance	The annual market-adjusted stock return
Exchange	Listing stock exchange	Dummy variable. If the company is listed in Shanghai stock exchange, the variable equals 1; if the company is listed in Shenzhen stock exchange, the variable equals 0

Appendix 2

The regression results against CERs with varying event windows

Model 1

	CER(-2,2)	**CER(-3,3)**	**CER(-5,5)**	**CER(-10,10)**	**CER(-15,15)**	**CER(-20,20)**	**CER(-25,25)**	**CER(-30,30)**
DNorm	-0.0158**	-0.0205**	-0.0310***	-0.0402**	-0.0366**	-0.0439**	-0.0445*	-0.0718***
DNorm×Unlocked	0.1796**	0.1723*	0.2221*	0.0869	0.0914	0.3388	0.2557	0.4641
MulHLD	0.0023	0.0068	0.0209	0.0312	0.0205	0.0423	0.0353	0.0762
Size	0.0039	0.0056*	0.0068*	0.0068	0.0075	0.0038	0.0067	-0.0006
Leverage	0.0009	-0.003	-0.0014	0.0111	0.0147	0.0151	-0.0024	-0.0019
ROE	0.0001	0.0001	0.0003	0.0003	0.0004	0.0002	0.0005	0.0006
Dual	-0.0008	-0.0074	-0.0208*	-0.0361**	-0.0378**	-0.02	-0.0459*	-0.0488*
IndDir	0.0087	0.0085	-0.0114	0.0389	0.05	0.1164	0.1934	0.1943
Hld1_9	0.0212	-0.0103	0.0698	0.0457	0.1111	0.1781	0.1409	0.0486
Exchange	-0.0009	0.0029	0.004	0.0019	0.0025	0.0132	0.0103	0.0199
MktPerform	-0.1912*	-0.1523	-0.0422	0.1451	0.0984	0.321	0.3283	0.6534*
Industry	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Constant	-0.0923	-0.1257	-0.1145	-0.2138	-0.2859	-0.2462	-0.3184	-0.1735
Adj-R^2	0.027	0.027	0.03	0.032	0.032	0.032	0.032	0.037

Model 2

	CER(-2,2)	CER(-3,3)	CER(-5,5)	CER(-10,10)	CER(-15,15)	CER(-20,20)	CER(-25,25)	CER(-30,30)
Dlast	0.0131**	0.0137*	0.0234***	0.0433***	0.0488**	0.0533***	0.0626***	0.0709***
Normal	-0.0049	-0.0146	-0.0227*	-0.0335**	-0.0336*	-0.0414**	-0.0493**	-0.0356
Dlast×Unlocked	0.0451**	0.0446	0.0657*	0.1137**	0.1086**	0.1578***	0.1468**	0.1229*
MulHLD	0.0154	0.0106	0.0613	-0.0082	-0.0183	-0.0164	-0.0256	-0.0371
Size	-0.0009	-0.0008	-0.0051	-0.0046	-0.0077	-0.0181***	-0.0169**	-0.0158**
Leverage	-0.0141*	-0.0116	0.0046	0.0146	0.0219	0.0099	0.0063	0.0064
ROE	0.0001	-0.0011	-0.002	-0.0025	-0.003	-0.0022	-0.0017	-0.0025
Dual	-0.0066	-0.0111	-0.0144	-0.0185	-0.0228	-0.0275	-0.0356	-0.0295
IndDir	0.0114	0.0091	0.0168	0.0697	0.0281	0.0454	0.0206	0.0713
Hld1_9	-0.0577	-0.0892	-0.1435*	-0.1461	-0.1222	-0.1131	-0.1257	-0.1089
Exchange	0.0024	0.007	-0.0017	-0.0072	-0.006	-0.0058	0.006	0.0031
MktPerform	0.0199	0.1623	0.152	0.2407	0.332	0.5887*	0.3659	0.425
Industry	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Constant	0.0731	0.0519	0.1381	0.0995	0.1177	0.3629*	0.3436	0.2429
Adj-R^2	0.009	-0.003	-0.002	0.001	0.011	0.039	0.024	0.029

Model 3

	CER(-2,2)	CER(-3,3)	CER(-5,5)	CER(-10,10)	CER(-15,15)	CER(-20,20)	CER(-25,25)	CER(-30,30)
Dcha	0.009	0.0272**	0.0336**	0.0362**	0.0573***	0.0610***	0.0707***	0.0663**
Dcha×Unlocked	0.0544*	0.0806	0.0854	0.0773	0.1514*	0.1633*	0.1365	0.1443
MulHLD	0.0154	0.0064	0.059	-0.0063	-0.0194	-0.0152	-0.0209	-0.0322
Unlocked	0.0509***	0.0479	0.0758**	0.1215***	0.1499***	0.1935***	0.2062***	0.1996***
Size	-0.001	-0.001	-0.0055	-0.0051	-0.0086*	-0.0191***	-0.0183***	-0.0172**
Leverage	-0.0149*	-0.013	0.0037	0.0143	0.0203	0.0083	0.0058	0.0052
ROE	0	-0.0012	-0.0022	-0.0028	-0.0033	-0.0026	-0.0022	-0.003
Dual	-0.0062	-0.0109	-0.0145	-0.0192	-0.0224	-0.0274	-0.0358	-0.0289
IndDir	0.0143	0.0175	0.0287	0.0854	0.0481	0.0684	0.0486	0.0956
Hld1_9	-0.0606	-0.0799	-0.1469*	-0.1675*	-0.1476	-0.1464	-0.1868	-0.1742
Exchange	0.0027	0.0072	-0.0018	-0.007	-0.0057	-0.0049	0.0065	0.0044
MktPerform	0.0112	0.1582	0.1498	0.239	0.3263	0.5796*	0.3681	0.4227
Industry	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Constant	0.0689	0.0345	0.1164	0.0711	0.09	0.3283*	0.3079	0.22
Adj-R^2	0.01	-0.001	0.001	0.003	0.019	0.045	0.033	0.036